very interesting results as a consequence of the investigation of areas of audibility and *inaudibility* surrounding great sources of sound, such as the blasting for the Jungfraubahn, the bombardment of Antwerp, a munition explosion in England, etc. It seems natural that the Halifax explosion, violent enough to break glass many miles distant and to be heard scores of miles away at sea, should be investigated the same way; but I have read and heard nothing of any such study. It is, of course, a matter for the scientists of the neighboring region, and perhaps they have taken it up.

Willard J. Fisher

PRIMITIVE KNOWLEDGE OF INOCULATION

In an article on "The Origin of the Custom of Tea Drinking in China," Science, March 15, R. A. Gortner remarks that "it is extremely improbable that it was recognized centuries ago that typhoid fevers, etc., were disseminated by pollution of the water supply, especially inasmuch as there was no knowledge of microorganisms or of the rôle which they play in disease until the work of Pasteur (1857–1863)." In adopting this conclusion as *a priori* valid it seems to me that Gortner is in danger of making the same error that was made by Sir Richard Burton in 1854. Burton states ("First Footsteps in East Africa") that "The mosquito bites bring on, according to the same authority (the Somal), deadly fevers; the superstition probably arises from the fact that mosquitoes and fevers become formidable about the same time." This is not the only case, we may be sure, in which causal relations have been recognized long before the causal mechanism was known.

Knight Dunlap

SCIENTIFIC BOOKS

The Anthocyanin Pigments of Plants. By Muriel Wheldale. Cambridge University Press. 1916. Royal 8vo. Pp. xii + 318. Price 15s net.

The science of chemistry has grown so rapidly during recent years that it is impossible for an individual to acquire a thorough knowledge of all of its branches, and even to master a single phase of the science often means laborious searchings through the chemical literature. Fortunately there have appeared during the last decade a number of monographs, each written by an authority in that particular field, which deal thoroughly with a special topic and sum up all of the available literature. Such a compilation is the present volume.

What causes the production of the colors in a flower? Every one has asked himself the question and numerous chemists have attacked the problem, yet it is only within recent years that any definite knowledge has been attained and we still have a long way to progress before we know the whole truth. It is fortunate, however, that Miss Wheldale has accumulated such evidence as is at present available.

Her studies of anthocyanin began with a study of the genetical behavior of these pigments, but she soon ascertained that biological phenomena have for their basis chemical reactions, with the result that she undertook to analyze the chemical changes which were involved in the hereditary behavior of flower coloration. The present volume is divided into two parts. Under Part I., "General Account of Anthocyanins," we have "Introductory," consisting mainly of the older literature of the subject; "The Morphological Distribution of Anthocyanins"; "The Histological Distribution of Anthocyanins"; "The Properties and Reactions of Anthocyanins"; "The Isolation and Constitution of Anthocyanins"; "Physiological Conditions and Factors Influencing the Formation of Anthocyanins"; "Reactions Involved in the Formation of Anthocyanins"; and "The Significance of Anthocyanins," practically all of which are taken up from the chemical viewpoint.

Under Part II., "Anthocyanin and Genetics," we find "Classes of Variation"; "Details of Cases of Mendelian Inheritance in Color Varieties"; "Connection of Flower Color with the Presence of Anthocyanin Vegetative Organs, Fruits and Seeds"; "Heterozygous Forms"; "Color Factors in Reduplication

Series"; "Pattern in Color Variation"; "Striped Varieties and Bud Variation"; "The Effect of Outside Factors on Color Variation"; "Connection Between Color and Other Plant Characters"; and "The Chemical Interpretation of Factors for Flower Color;" all discussed from the standpoint of the geneticist. In addition there is appended a bibliography of 645 titles, to the majority of which Miss Wheldale has added a short descriptive notice indicating the nature of the contents of the paper.

To any one who has followed Miss Wheldale's researches it is needless to add that the work is thoroughly done. Apparently as much space has been given to the papers of her critics as to her own work, so that the reader can draw his own conclusions as to the facts involved. If there is any one fault to find with the work it would seem to the writer to be that the author has not drawn upon her imagination sufficiently to formulate theories which would appear to be warranted by the facts which she presents. This is not a common fault in works of this nature where chemical and biological phenomena are involved and perhaps the author is correct in being extremely conservative. At any rate she can not be accused of attempting, by publishing this monograph, to further any pet hypothesis.

ROSS AIKEN GORTNER
UNIVERSITY OF MINNESOTA

DR. KEEN ON MEDICAL RESEARCH

DR. W. W. KEEN, the Nestor of the American medical profession, has given us a delightful little book on "Medical Research and Human Welfare," being the Colver Lectures of Brown University for 1917.

Dr. Keen is peculiarly fitted for his task, as he was trained in the old septic era of surgery before the civil war, and was a part and parcel of the war with all its attendant horrors, its infections and gangrenous wounds with maggots, and its enormous percentage mortality, and yet has lived not only to witness but to promote the new era of antiseptics and to enjoy the phenomenal changes thus wrought in his own work and that of his colleagues.

This interesting little book has a twofold value, it will attract the lay public asking for a conspectus of the progress of the last forty years in charming readable non-technical terms; it will also interest doctors, who will enjoy a brief historic retrospect of professional achievements told in just such simple terms as they themselves are apt to use over a fireside conversation when the older men are prone to indulge in reminiscences and comparisons.

A further use is to furnish material for those who wish to forestall interference on the part of the anti-research people (who call themselves "antivivisectionists"), with medical progress.

The medical profession in our day has stepped forward into an era of medical statesmanship, and now needs constantly to appeal to the public for moral support and cooperation in many matters of vital interest to the whole body politic. It would be well for this reason if this book were widely read and the facts kept well in mind and often used in arousing the sympathy of the public in one of the greatest of all causes—medical progress, the saving of life and health.

HOWARD A. KELLY

THE ANNUAL MEETING OF THE NATIONAL ACADEMY OF SCIENCES

THE program of the scientific sessions of the meeting held in Washington beginning on April 22 was as follows:

MONDAY, APRIL 22

Morning Session

The effects of a prolonged reduced diet on twenty-five college men:

I. On basal metabolism and nitrogen excretion, by Francis G. Benedict.

II. On neuromuscular processes and mental condition (illustrated), by Walter R. Miles (introduced by F. G. Benedict).

III. On efficiency during muscular work and general muscular condition (motion pictures), by H. Monmouth Smith (introduced by F. G. Benedict).

The partial occlusion of great arteries in man and animals (illustrated), by W. S. Halsted.

Three papers (illustrated):

(*a*) The favorable effect of subcutaneous injec-